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AUTHOR Moerk, Ernst L.
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ABSTRACT

This investigation addresses problems of defining verbal imitation, and suggests solutions by analyzing verbal interactions between two children and their mothers. Children were between 18 and 35 months old, with a mean length of utterance between 1.4 and 4.2 morphemes. Analyses focus upon the uses these children made of maternal models; 10 subsets of imitational phenomena are differentiated. Frequencies of these subsets are presented together with the sequential contingencies between maternal antecedents and the subsets of filial imitations. With the younger child, phenomena resembling generalized imitation training were encountered (i.e., the training of a rehearsal strategy and not only the training of specific linguistic contents). With the older child, the variety of interactional patterns and of linguistic contents trained was larger. Microanalyses, based upon verbatim examples of verbal interactions, suggest differential filial processing, either in the sensory register only, in short-term memory, or in long-term memory. These differential levels of processing were sometimes encountered even within the same utterance. A three-dimensional coordinate system is suggested for the differentiation of the various imitative uses of model utterances. The coordinates represent (1) the level of processing of the model, (2) the degree of isomorphy between model and imitation, and (3) the type of learning achieved through these processing strategies. (Author/RH)

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The fuzzy set called 'imitations.'

Ernst L. Moerk

California State University, Fresno

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Critical suggestions are invited!

Abstract

Problems of defining verbal 'imitation' are conceptually clarified and solutions are suggested by analyzing verbal interactions between two children and their mothers. The children, Adam and Eve, were between 18 and 35 months old, with a MLU range between 1.4 and 4.2 morphemes. The analyses focus upon the usese these children made of maternal models and ten subsets of imitational phenomena are differentiated. The frequencies of these subsets are presented together with the sequential contingencies between maternal antecedents and the subsets of filial 'imitations.' With the younger child, Eve, phenomena resembling 'generalized imitation' training, i.e., the training of a rehearsal strategy and not only the training of specific linguistic contents, are encountered. With the older child, Adam,the variety of interactional patterns and of linguistic contents trained is larger. Microanalyses, based upon verbatim examples of verbal interactions suggest differential filial processing, either in the sensory register only, in short-term memory, or in long-term memory. These differential levels of processing are sometimes encountered even within the same utterance. A three-dimensional coordinate system is suggested for the differentiation of the various imitative uses of model utterances. The coordinates represent a) the level of processing of the model, b) the degree of isomorphy between model and 'imitation,' and c) the type of learning achieved through these processing strategies.

The fuzzy set called 'imitations.'

Everybody who sees/hears a prototypcial imitation recognizes it immediately. "Imitations" fell,therefore, until recently under the realm of unexamined concepts and were explored freely if somewhat uncritically. Jespersen (1922) and Stern (1924) emphasized the importance of imitation for language acquisition, presuming the phenomenon to be unmistakable. But already Lewis (1936) sounded a note of caution in asserting that imitation itself develops, being only rudimentary in infancy. If linguistic imitation grows and changes while language itself grows, then there should be several or many forms of imitation.

When the phenomenon of imitation was explored again in a careful and critical manner during the fifties and sixties - in a climate of renewed nativism and anti-learning presumptions - , the definitional tasks were confronted. During this more critical evaluation, the assumption expressed in the above introductory sentence was found to be circular:'A prototypical imitation is prototypical, i.e., easily recognizable.' In the search for distinctive operational definitions, two criterial dimensions were focused upon: a) absolute temporal immediacy and b) complete structural homology. The early study of Ervin (1964) exemplifies this approach. A range of problems were, however, soon recognized in this approach. The criterion of temporal immediacy presumes a memory span of the child no longer than a few seconds. Everyday observations and extensive

research proves this to be incorrect. Especially the extensive work of Bandura has shown that learning from a model and the performance of the learned behavior could be separated by considerable time intervals.

With the questioning of the temporal criterion, the definitional emphasis shifted upon structural homology. A shift that - if possible - compounded the problems. Upon closer inspection it soon became clear that, even within the temporal immediacy criterion, the identity between imitation and model was almost never perfect. Phonetic, phonemic, and syntactic simplifications on the side of the child were the rule. With some temporal interval between model and 'imitation' permitted, the child's transformations of the model utterance became more predominant and the delimitation between imitative and fully productive utterances became ever more difficult to perform. Ruth Clark's (1974, 1977) studies are some examples of this early differentiated approach. Whitehurst (1977, 1978) added a further challenge by proposing the concept of 'selective imitation', showing that children might imitate only the grammatical structure of the model without even repeating a single word of the surface string. This was the status of the field, when the study to be reported was conceptualized and initiated.

Methods

Extended records of verbal interactions from two children and their mothers were analyzed. The children ranged in age from 18 to 35 months and in MLU between 1.4 and 4.2 morphemes. For the definition of imitation structural criteria were mainly

employed, within an approximate temporal constraint of maximally one page of transcripts between model and 'imitation ' and nine different types of 'imitation' were specified. In addition, a category of 'quotations' from picture books was formed for a preliminary differentiation of conversational versus literary input effects. Frequencies of the established phenomena were established and the conversational patterns in which these forms of imitation appeared were ascertained. Markov models and transitional and joint probabilities for two-step and three-step interaction sequences were computed in order to quantitatively describe these interaction structures. For the long-term analyses, principles from time-series and event-series were adapted and employed.

Results

In accordance with the initial descriptive/classificatory goals of the present study the subsets that were differentiated in the overall set of imitations will be presented first. After a label and a brief definition, the frequencies of appearance of these subsets in the 18 and 20 hours, respectively, of the interactions of Adam and Eve with their mothers will be presented. It has to be specified, however, that these subsets are not assumed to exhaustively represent the overall set. Not only is it expected that new phenomena will be discovered; because of the temporal ceiling employed, the entire set of imitations following the model after hours or days (see Snow & Goldfield, 1983) has not yet been captured. An exhaustive presentation will therefore introduce new and more complex phenomena.

Insert Table 1 about here

The specific aspects of Table 1 will have to be presumed as self-explanatory and only some of the general features will be commented upon. It is obvious from the labels and definition that cognitive processes of diverse complexity must be involved in these multiple forms of imitation. 'Simple imitation' represents mere echoing and 'Reduction' entails even less than an accurate echo. In contrast, most of the other forms of imitation presume quite complex processes of cognitive analysis and synthesis. Since, almost without exception, all the instances of imitative use of linguistic items employed shortly before resulted in semantically and pragmatically meaningful utterances, it is suggested that the simplifications in recall and retrieval, indicated by the imitations, are utilized to shift processing emphasis to more demanding tasks. The overall similarities between both children in the frequencies of use, together with one or two specific differences, are obvious too from Table 1. Some of the differences will be touched upon in connection with Table2 and Table 3.

Having drawn attention to two of the less obvious aspects of Table 1, the main focus will be upon a theoretically fascinating question: All forms of 'imitation' entail by definition a form of rehearsal of a previously perceived item or items. Both children exhibited approximately 1000 instances of such rehearsals in the 18 and 20 hours, respectively, analyzed. This is around 50 per

hour and almost one per minute. On the other hand, extensive laboratory research, as summarized by Flavell (1977) and more recently by Halford (1982), besides several others, has produced the consistent finding that children before the age of 5 years do not employ spontaneously memorization strategies. The use of such strategies, including rehearsal, develops mainly during the elementary school years and into the high school years. To formulate the problem more generally: If young children prove so inefficient in memorization, as shown by laboratory research, how can they learn so much during early childhood, including a quite extensive vocabulary and syntax?

It appears quite obvious that the findings of Table 1 and the many reports on imitation in first language acquisition belie the more pessimistic interpretations of the laboratory findings. Children do indeed employ memorization strategies of various complexity; they equally obviously acquire much information that is based upon memorization, that is, the vocabulary of their mother tongue. The solution to this apparent conflict might lie in Flavell's distinction between 'production deficiencies' and 'mediational deficiencies.' Even in the laboratory, once the children had been induced to produce rehearsal strategies, no mediational deficiency was found. It appears, consequently, that children produce rehearsal strategies regularly and spontaneously in the everyday situation of first language acquisition, but not so easily in the contrived situation of the laboratory.

A close look at the interaction patterns between mothers and children in their everyday conversations shall provide some first indications to explain this difference. Table 2, providing data from Eve, the younger subject, and her mother provides the clearest evidence.

Insert Table 2 about here

Again only selected points from Table 2 can be commented upon, though all of it deserves closest study. Two major points to aid the interpretation need first be specified: First, all 'filial strategies' are imitations and the definition of these imitations is found in Table 1. Second, for all practical purposes, the 'positive feedback' encountered so consistently in the mother's second turn, after her child produced an imitation, is equivalent with the behaviorists 'reinforcemert.' It consists mostly of a confirming/agreeing "yes", often followed by an additional maternal imitation. The theoretical rationale for this interpretation has been provided by Moerk (1983 a,b) and cannot be repeated here. Adding to this the high probability that a maternal repetition of the child's preceding utterrance represents for the child an acceptance and , therewith, a 'reward' too, Table 2 indicates that Eve's mother very systematically encourages the productions of imitations in her daughter's speech. Eve having been only 18 months old at the beginning of the observation period, most of her

imitations still entail reductions, that is, omissions of minor morphemes, but this does not mean uniform imitations. As the first turn of the mother indicates, the models the child repeats are highly varied, ranging from simple vocabulary items, to a variety of syntactic exercises, and the emphasis upon bound morphemes.(For the full definition of all the instructional techniques of the mother, Moerk (1983 a) will have to be consulted.) That this variety of modeling, resulting in a variety of imitations, implies also a variety of cognitive processes will be argued in the last section of this presentation.

The main message of Table 2 can be integrated into a few concluding statements: While mother and child communicate about their everyday concerns, the mother provides a variety of sophisticated linguistic instruction. She has to do this out of sheer necessity because her linguistic messages have to be disambiguated for her child in order to be understood by the latter. But at the same time, the mother teaches also strategies to handle the linguistic input, whether it is simple repetition, or repetition with substitution of items, or partial repetition with the addition of new items. Such strategy teaching has, certainly, been reported previously : The well-known'prompting' is a prompting to rehearse. 'Incomplete sentences' employed by the mother invite not only a filial rehearsal but also utilize the recency effect. And, of course, maternal self-repetitions and imitations of her child's utterances model the strategy of imitation.

Table 2, being derived from only one subject - and a very young one, for that matter - could easily lead to an understimate of the variety and complexity of phenomena encountered in imitation. An equivalent Table, representing the interactions of Adam and his mother, will therefore be presented as Table 3. The cause of the differences between the interactions of Eve and Adam can, of course, not be established. An age difference, and the sex difference are confounded with a large variety of individual differences, one important one certainly being the interaction style of the mother.

Insert Table 3 about here

Focusing first upon the filial imitations in Table 3, it is obvious that Adam employs a much wider variety of imitational forms, most of them reflecting more complex cognitive processes. Adam and his mother also rely more upon quotations from literary sources. Very impressively, the mother, in her second turn, does not provide a single instance of 'positive feedback' or reward in the obvious way Eve's mother provided it. To establish whether the imitation strategy in Adam was well enough established so that it needed only minimal maintenance reinforcement, or whether the maternal imitations of the child's utterances constituted sufficient reinforcement would require a separate study. Focusing upon the first turn of the mother, clear differences in the models the child imitates become apparent too. Simple vocabulary perseveration is less pre-

dominant. Adam might,however, pick up new and more rare vocabulary items in the form of quotations, as suggested from a similar study by Moerk and Moerk (1979). The simple syntactic exercises, as represented by 'Substitution drills' and 'Description', i.e., more-word description of factual relationships observable simultaneously in the environment, are deemphasized in favor of 'Morpheme perseverations' and the transformational syntactic exercises of 'Frame variation' and 'Optional transformations.' Since the transitional probabilities indicated that Adam is prone to imitate these models, his imitations, of necessity, will also pertain to more complex linguistic contents. A fascinating relationship is even indicated by the data in Table 3: Simpler models seem to be responded to by Adam with more complex forms of imitation, and more demanding models results in the simple "Reduction" imitation. This technique would certainly represent a quite sophisticated selective process, maintaining a manageable information processing load. More detailed analyses are, however, needed to support this suggestion.

Conclusion

Even excluding 'imitations' performed hours and days after the model was presented, a considerable variety of imitations was described, based upon structural criteria. If functional criteria had been employed, the variety would probably have been even larger. The long-delayed uses of models certainly involve long-term memory and challenging retrieval processes, adding to the varieties.

In this last sense, imitation shades imperceptibly into overall language use since, as many authors have remarked, in the broadest sense all language use is a form of imitation. Considering the complete continuum of the temporal dimension, from an immediate repetition to very prolonged delays, and the many shades of structural similarity versus structural changes, it has to be concluded that the set of imitations has no clear outside limits, although the central prototype is clearly specified, consisting of immediate and identical repetitions. This logical problem certainly explains past definitional controversies, but it does not yet present at solution.

Two avenues towards a solution seem possible: The first one might be similar to the one attempted in the above presentation; namely, the careful delimitation of a number of subsets, based upon temporal, structural, or functional criteria. Whereas borderline cases will remain with this approach, due to the gradual shading of the 'family resemblances' (Wittgenstein),acceptable interrater reliabilities and therefore workable concepts can be established.

A more radical, but possibly a better way might result from a new and more functional/process-oriented approach. Both memory research and evidence from research on imitation suggest that three major processes are involved in what is labelled imitation. All three processes pertain to the repetition of items received in the input.On a most

immediate, superficial level of processing, the items are only processed in the sensory register. Whereas the latter is mostly identified with the 'very-short term memory', of a duration of a few seconds, this need not be the case, especially with young children and infants who mainly process on this level. The research on 'eidetic memory' provides evidence for possible longer storage. What is commonly labelled short-term memory is where much of the interactional processing can be observed. A capacity of around eight items and a duration of a few minutes is the characteristic of this level or store. Many of the observed substitution sequences or 'drills' belong to this level together with the other grammatical exercises indicated in the tables. Long-term memory would not only involve an extended time period but also relatively stable units, rules, or patterns.

In integrating the conceptualization of three different memory stores (Atkinson & Shiffrin, 1968) and that of various levels of processing (Craig, 1973) two criteria are combined in describing the relationships between input and reproduction: the temporal dimension, since all input is first received in the sensory register, and the cognitve/ learning dimension, since the different levels of processing will have different cognitive consequences.

A few examples might indicate the potential of the suggested approach although its usefulness will have to be explored in extensive studies. Almost at the beginning of

the entire recording period, an excellent example of the three levels of processing and the use of the memory stores is encountered. During the first recording session, Eve had just heard the name 'Fraser' mentioned twice in the conversation between Fraser and her mother. The name was probably new or at least unfamiliar to her and she tries immediately to master it. See example 1 of Table 4.

Insert Table 4 about here

Within several feedback cycles, employing repeated models for imitation, Eve has approximated the correct enunciation of Fraser's name. After around one page of transcribed text, Eve says again 'Fraser,' which is responded to by the mother with 'Mr. Fraser, yes. Mr. Fraser.' No phonetic transcription is provided anymore in the transcripts, indicating that this rehearsal from shortterm memory was close to the expected level. Note also that the mother has employed already twice an emphatic 'yes', rewarding the child for the improved performance: 'that's much better.' A few utterances after Eve's spontaneous recall, she asks 'That?' and her mother responds 'What is that? That's Mr. Fraser.' Here the child has added to her rehearsal strategy a testing strategy which is commonly employed by mothers and children in their vocabulary teaching/learning interactions.

When the mother inserts at this time the pragmatically motivated request 'There drink the water.', Eve produces the following utterances, indicating a combination of several

processes: "Fraser water' is repeated four times within a short time span and it is followed by 'Fraser coffee', the word 'coffee' having been mentioned before by Fraser.

In the above sequence of utterances, processing of the new name in the sensory register is first followed by several rehearsals in short-term memory. Then she retrieves from long-term memory the syntactic abstraction, NOUN - NOUN, and fills one slot with the item exercised in short-term memory and the other with the words 'water' and 'coffee' that were well known, i.e., stored in long-term memory, but whose retrieval was facilitated by their immediately preceding occurrence in adult models. Sensory-register processing, short-term rehearsal, testing of the rehearsed item, aided and unaided retrieval from long-term memory are all involved, resulting in the two new constructions 'Fraser water' amd 'Fraser coffee.'

Another example, still from the early stages, suggests a further fascinating combination of processes: In the second hour of observation, Eve's mother says: 'You go write on the paper.' and Eve repeats 'Write (a) paper.' This is followed by the mother's clarifying correction 'Write on the paper', a further chance for the analysis of the input. Eve repeats thereafter several times 'Write (a) paper.' It appears, Eve picked up the hint that rehearsal was required; she also processed the entire utterance in her sensory register by recognizing that two stressed elements were separated by an unstressed segment. But whereas she could easily match the stressed elements with items in her long-term memory, the

unstressed segment remains represented in her short-term memory rehearsal by a slot filled with an undifferentiated filler '(a)'. What she is thereby storing is a three-element construction with a verb followed by a undifferentiated slot, followed by a noun, certainly an important exception to the more common VERB - OBJECT construction.

Sensory-register processing is, however, not restricted to the earliest samples. Even fluent speakers often pick up a multi-element pattern without hearing clearly all the elements in the pattern. These elements are then often provided by a sort of 'Cloze Procedure.' In sample 18, one of the last recordings of Eve's interactions with her mother, we find a similar example. The mother says: 'Well you (have to) have your spoon, yes.' Eve says immediately afterwards: 'Fraser .... Fraser and Colin have a has a spoon for he cup.' This utterance entails items recalled unaided from long-term memory; it also contains items well analyzed and stored but recalled with the aid of the model, such as spoon and have; finally the construction 'have to have' has been analyzed in the sensory register as a three-unit construction, the first item has been matched from long-term memory but the other two are filled in with approximations: the 'a' being an old filler known from the preceding example, and the 'has' an item from long-term memory resembling in sound the one in the model utterance.

The above examples can, of course, only give a very preliminary indication of the possible approaches and the processes involved. The suggested interpretations also need

to be more fully substantiated. Example 4 in Table provides a variety of instances wherein the differential processing of maternal models can be shown. '..have buy' uttered by Eve in imitation of 'have to buy' shows only partial processing in the sensory register. Even the previously supplied filler 'a' is missing. In '... a blue one' the structure is imitated correctly but the vocabulary item is substituted incorrectly from long-term memory. 'Not a blue one' presents a imitation from the sensory register, but the formulation, ten utterances later, '..a new one' indicates that deeper analysis had followed the sensory processing. 'Hava' is assimilated to 'gonna' from short-term memory. 'Smack' is employed by Eve only after priming, that is, from short-term memory; without priming she replaces it by the more familiar 'hit.' The entire utterance 'I hava smack my bottom' is only partly analyzed, whereas the full analysis, a few utterances later, exhibits the replacement of 'I' by 'You', i.e., long-term memory and deeper processing. But even in this fully analyzed utterance, 'going' was probably primed by the preceding maternal question and would therefore be supplied from short-term memory.

Integrating the above considerations with evidence from the literature, imitations certainly appears to be a multi-faceted phenomenon. The most central dimension for the differentiation of its varieties might be that of level of processing as conceived by Craik (1973). These levels of processing could be operationally distinguished on the temporal dimension.

Partly influenced by these diverse levels of processing is the second dimension, the degree of isomorphism between model and imitation: The more deeply processed items are generally more altered in the direction of the child's linguistic schemas. Similarly related to the first dimension is the third one, the type of learning: from phonetic learning through the sensory register, to pattern abstraction and vocabulary acquisition in short-term memory, to the flexible formation of rules and the establishment of semantic networks in long-term memory, the level of processing would deepen and the time interval would increase.

Considering these three dimensions as a coordinate system, the coordinates would, therefore, not be orthogonal but oblique. In the center would be found the 'prototypical imitation,' being completely isomorphic with the model and following it immediately. The more the input items are processes, the more it would be altered shading finally into independent productions. Utterances and their units would occupy varibus positions in this coordinate system, and these positions would reflect not only the degree of isomorphy to the model but also the processing performed by the child.

Highly enterprising investigators might want to add pragmatic dimensions, as when children employ imitation for turn-taking without comprehension or when they use formulae to convey meaningful meesages which they cannot yet formulate spontaneously. These pragmatic analyses reflect, however, a quite different emphasis and require separate extended studies.

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Table 1

Ten subsets of 'imitation' and their frequencies in two children.

Codes	Label	Definition	F/Adam	F/Eve
01	Simple imitation	Identical imitation admitting only pronominal substitution	80	103
02	Reduction	Minor syntactic elements, i.e., functors are deleted, contentives are retained	502	395
03	Structural imitation	Structures from the model that are unusual for the chid are retained, words are replaced	10	6
04	Substituting imitation	Most words and the structure are retained, one or a few items are substituted	180	140
05	Combinatory imitation	Combines items from two or more model utterances in own utterance	18	27
06	Incorporat. imitation	Subsumes single constituent utterance of model into own longer utterance	0	9
07	Chaining imitation	Combines items from model with own newly produced or repeated items	217	100
08	Integrative imitation	A sentence fragment of the child completes a preceding fragment of the model	29	36

Table 1 (cont.)

Codes	Label	Definition	F/Adam	F/Eve
09	Imitative self-repet.	Imitation of the model being also a repetition of own preceding utterance	113	104
10	Qotating imitation	Items from books, stories, or songs are employed, possibly in adapted form	45	63
			Sum:1194	983

Note: The frequencies are derived from 18 hours of interactions of Adam and from 20 hours of interaction of Eve with their respective mothers, fathers, and - to a small part - the observers.

TABLE 2

Triple sequences of instructional interaction of the pattern: maternal teaching - filial learning - maternal teaching. Data from Eve and her mother.

Maternal technique	Filial strategy	Matern. Technique	Frequency
Vocabulary persev.	Reduction	Positive feedback	20
Frame variation	Reduction	Positive feedback	19
Morpheme persever.	Reduction	Positive Feedback	13
Substitution drill	Reduction	Positive feedback	12
Description	Reduction	Positive feedback	12
Vocabulary persev.	Reduction	Vocabulary persev.	11
Substitution drill	Reduction	Expansion	11
Substitution drill	Reduction	Imitative self rep.	10
Expansion	Reduction	Expansion	9
Substitution drill	Reduction	Description	9
Frame variation	Reduction	Vocabulary persev.	9
Break-down sequ.	Reduction	Positive feedback	9
Opt. transformation	Reduction	Expansion	8
Description	Reduction	Expansion	8
Vocabulary persev.	Imit. self rep.	Vocabulary persev.	8
Expansion	Reduction	Positive feedback	7
Opt. transformation	Reducation	Positive feedback	7
Substitution drill	Reduction	Uncodable	6
Vocabulary persev.	Reduction	Imitative self rep.	6
Vocabulary persev.	Imit. self rep.	Positive feedback	6
Frame variation	Chaining imit.	Positive feedback	6
Frame variation	Reduction	Opt. transformation	6
Imitative self rep.	Imit. self rep.	Positive feedback	5
Opt. transformation	Reduction	Vocabulary persev.	5
Frame variation	Reduction	Morpheme persever.	5
Frame variation	Reduction	Substitution drill	5
Description	Reduction	Frame variation	5
			238

TABLE 3

Triple sequences of instructional interactions of the pattern: maternal teaching - filial learning - maternal teaching. Data from Adam and his mother.

Maternal technique	Filial strategy	Maternal techinque	Frequency
Morpheme persev.	Chaining imit.	Morpheme persev.	16
Morpheme persev.	Reduction	Morpheme persev.	16
Quotation	Integrat.imit.	Quotation	14
Item specification	Integrat. imit.	Quotation	13
Frame variation	Reduction	Morpheme persev.	13
Frame variation	Reduction	Substitution drill	13
Opt. transformation	Reduction	Opt. transformation	12
Substitution drill	Reduction	Opt. transformation	12
Quotation	Quotation	Quotation	11
Opt. transformation	Reduction	Morpheme persev.	11
Substitution drill	Reduction	Morpheme persev.	11
Item specification	Quotation	Quotation	11
Morpheme persev.	Reduction	Opt. transformation	10
Vocabulary persever.	Reduction	Vocabulary persev.	10
Morpheme persev.	Chaining imit.	Expansion	10
Morpheme persev.	Substituting im.	Morpheme persev.	10
Quotation	Integrative im.	Item specification	10
Substitution drill	Reduction	Substitution drill	9
Quotation	Quotation	Item specification	9
Item specification	Integrative im.	Item specification	9
Item specification	Quotation	Item specification	8
Morpheme persev.	Reduction	Substitution drill	8
Morpheme persev.	Chaining imit.	Vocabulary persev.	8
Morpheme persev.	Reduction	Vocabulary persev.	8
Vocabulary persev.	Chaining imit.	Vocabulary persev.	7
Frame variation	Reduction	Expansion	7
			276

Table 4

Verbatim examples and hypothesized processes.

Child:	Mother:	Processes:
EXAMPLE 1:	(The name 'Fraser' mentioned twice.)	Processing in sensory register and successive approximations in productions.
Fraydiy		
	I think that was 'Fraser.'	
Fraydiy		
	What? Are you saying 'Fraser'? 'Mr. Fraser?'	
Fraydae		
	Yes, that's much better.	
Fraydsay		
	'Mr. Fraser?'	
(One page text intervening)		
Fraser (No phonetic transcription = close enunication)		Rehearsal from STM
	Mr. Fraser, yes. Mr. Fraser.	
(A few utterances intervening)		
That?		Testing strategy
	What is that? That's Mr. Fraser.	
(Mother suggests "There drink the water.")		
Fraser water		NOUN - NOUN frame from LTM combined with items from LTM with help from priming
Fraser water		
Fraser water		
Fraser water		
Fraser water		
(Fraser uses the word coffee in his conversation)		
Fraser coffee		
EXAMPLE 2:		
	You go write on the paper	
Write (a) paper		Frame processes in sensory register, items from LTM with help from priming.
	Write on the paper	
Write (a) paper (repeated several times)		

Table 4 (cont.)

Verbatim examples and hypothesized processes.

Child:	Mother:	Processes:
EXAMPLE 3:		
	Well, you(have to) have your spoon, yes.	
Fraser ..... Fraser and Colin have a has a spoon for he cup.		Unaided recall from LTM, primed recall from LTM Verb phrase frame processed mainly in sensory register.
	That's right.	
EXAMPLE 4:		
	We'll have to buy Becky a new one	
We have buy Becky a blue one		
	Not a blue one, a new one.	
Not a blue one.		
(Approximately 10 exchanges)		
An' we will buy Becky a new one		
(Several exchanges)		
	I'm gonna smack your bottom.	
(One exchange)		
	I'm gonna smack your bottom.	
I (hava) smack my bottom.		
	You bet I will smack your bottom.	
(Several related exchanges)		
	And what am I going to do when you throw it again?	
You (going) hit my bottom.		
	That's right.	

Auxiliary have to only partly processed in sensory register, as far as familiar from LTM, hava assimilated to gonna from STM, smack utilized only from STM and replaced with hit from LTM. Several items recirculated in STM through feedback cycles.